

PATENT ABSTRACTS OF JAPAN

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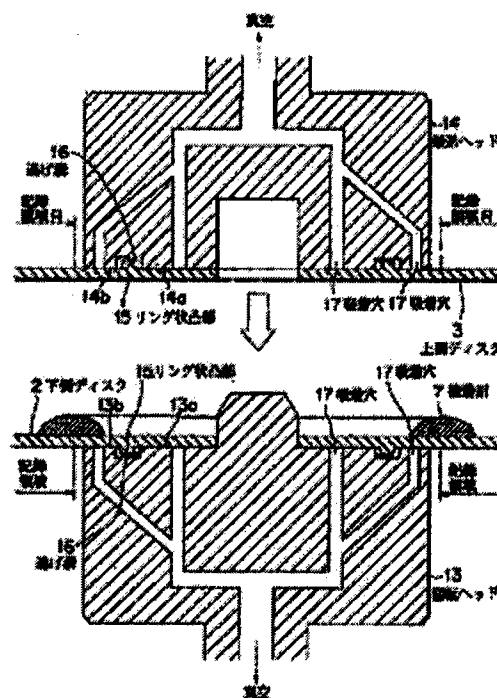
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(54) STICKING METHOD AND DEVICE FOR OPTICAL STICKING TYPE DISK

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a sticking method and device for optical sticking type disk by which the upper side disk can be brought into contact uniformly with an adhesive on the lower side disk without damaging the recording area of the disk.

SOLUTION: This device for producing an optical sticking type disk by sticking two upper and lower disks is provided with a means 13a, 14a for each sucking and holding on a planar member a disk retention part inside such a ring-shaped projection 15 for integration that is formed on the surface of the two disks 2, 3; a means 13b, 14b for each sucking and holding on a planar member at least a part between the outside of the ring-shaped projection 15 and the inside of the recording area; and a means 13, 14 for bringing the upper disk 3 into contact with the adhesive 7 discharged on the lower disk 2, with the two disks 2, 3 sucked and held. Since sticking is possible with the upper and lower disks reduced in camber, air bubbles can be prevented from being mixed inside the adhesive layer.



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CLAIMS

[Claim(s)]

[Claim 1]A laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk, comprising:

A means which carries out adsorption maintenance of the disk attaching part inside ring shape heights for accumulation currently formed in the surface of said disk of two sheets at a planate member, respectively.

A means which carries out adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] at a planate member, respectively.

A means to contact an upper disk in adhesives breathed out on a lower disk where adsorption maintenance of said disk of two sheets is carried out.

[Claim 2]A laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk, comprising:

A means which carries out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets at a planate member.

A means which carries out adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] at a planate member.

A means which opens adhesives supplied between said disks of two sheets to a necessary range in a high velocity revolution.

[Claim 3]A laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk, comprising:

A means which carries out adsorption maintenance of the outside of a disk attaching part of

the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets, and said ring shape heights at a planate member.
A means to perform curing treatment of adhesives which were able to be opened in a necessary range between said disks of two sheets.

[Claim 4]In a laminating apparatus of the optical lamination disk according to claim 1 to 3, A laminating apparatus of an optical lamination disk, wherein a flat-surface part of a planate member of both sides of a planate member which carries out adsorption maintenance of the inside of the above-mentioned ring shape heights for accumulation, and a planate member which carries out adsorption maintenance of the outside of said ring shape heights is the same flat surface.

[Claim 5]In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, While carrying out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation which breathes out adhesives on a lower disk among said disks of two sheets, and is formed in the surface of a disk of said upper and lower sides, respectively at a planate member, How to paste together an optical lamination disk making said up-and-down disk approach, and contacting an upper part disk in said adhesives where adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] is carried out at a planate member.

[Claim 6]In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, While carrying out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation currently formed in the surface of a bottom disk among said disks of two sheets at a planate member, How to paste together an optical lamination disk opening adhesives supplied between up-and-down disks to a necessary range by a high velocity revolution where adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] is carried out at a planate member.

[Claim 7]In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, To a planate member, where adsorption maintenance is carried out, the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets, and said ring shape heights, How to paste together an optical lamination disk performing curing treatment of adhesives which were able to be opened in a necessary range between up-and-down disks.

[Claim 8]In how to paste together the optical lamination disk according to claim 5 to 7, while carrying out adsorption maintenance of the inside of ring shape heights for accumulation of the

above-mentioned disk surface, How to paste together an optical lamination disk carrying out adsorption maintenance of the outside of said ring shape heights into the same flat surface as said inside.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to how to paste together the optical lamination disk which uses liquid adhesives especially about audio information, video information or the manufacturing method of the lamination disk which usually performs record or playback of data to a optical type, and a manufacturing installation, and its device.

[0002]

[Description of the Prior Art]As a laminating apparatus of the conventional optical disk, there was a thing as shown, for example in drawing 11. Drawing 11 shows the portion which piles up a disk among the laminating apparatus which stick a disk using liquid adhesives.

[0003]In drawing 11, the adhesives 7 are breathed out by doughnut form with the adhesive discharging apparatus which is not illustrated on the bottom disk 2.

Adsorption maintenance is carried out on the rotary head 113.

On this bottom disk 2, after the carrying head 114 which carried out adsorption maintenance of the upper part disk 3 descending and contacting the upper part disk 3 surface in the adhesives 7, adsorption of the upper part disk 3 is released, and it goes up and shunts again. Then, the rotary head 113 starts a high velocity revolution, where the adhesives 7 are inserted between them, it carries out the high velocity revolution of the upper part and the bottom disks 3 and 2, and it opens the adhesives 7 in the necessary range.

[0004]In order to avoid giving a crack to a record section by contacting the record section of a disk, said rotary head 113 and the carrying head 114 are constituted so that it may adsorb, the inside, i.e., the disk attaching part, of the ring shape heights for accumulation. In drawing 12, the upper part disk 3 and the bottom disk 2 are carried on the tray 50 in the state where it stuck with the adhesives 7 which are not hardened [which was able to be extended in the necessary range]. In this state, the upper part disk 3 and the bottom disk 2 are passing through the field

where ultraviolet rays are irradiated, and moving with Ultraviolet curing unit 9 which is a curing means, and adhesives are hardened. On the upper part disk 3, the weight 51 made from transparent construction material like glass for reform of the curvature of a disk may be carried.

[0005]

[Problem(s) to be Solved by the Invention]However, when adsorption maintenance of the inside of the ring shape heights for accumulation is carried out, curvature of the disk by internal distortion, prudence, etc. of a disk cannot be corrected. Drawing 13 showed this state.

[0006]Drawing 13 is a sectional view of drawing 11. The disk by which adsorption maintenance is carried out here has [the upper part and the bottom] large curvature. Although this curvature is generated for the above-mentioned Reason, what generates the ring shape heights 15 for accumulation as a folding point especially is large. The size of this curvature is uneven in many cases, and it is difficult to keep parallel the upper part disk 3 and the bottom disk 2 here. Thus, in the state which is not parallel, if the upper part disk 3 is contacted in the adhesives 7 on the bottom disk 2, the method of contact will become uneven and will tend to involve in air bubbles.

[0007]Since it can turn at the bottom disk 2 and a high velocity revolution cannot be carried out in the level state [be / nothing] even when carrying the upper part disk 3 on the bottom disk 2 and carrying out a high velocity revolution on both sides of the adhesives 7, it is difficult to open the adhesives 7 uniformly.

[0008]In order to cancel the above problems, also making a planate member carry out adsorption maintenance of the whole disk surface is considered, but now, said adsorbing member will contact the record section of a disk, and there is a danger of damaging the record section of a disk.

[0009]If it is in the adhesive setting part shown in drawing 12, even if it is in the state which the upper part disk 3 and the bottom disk 2 stuck on both sides of the adhesives 7, curvature which compounded the curvature of each single plate disk occurs. If the weight 51 is carried in order to correct this, the contact condition of the weight 51 and a disk surface with curvature will not become uniform, but will become the cause of making the thickness distribution of the adhesives 7 producing disorder. The adverse effect of soiling the member of the neighborhood also has the adhesives 7 extruded with weight.

[0010]Then, the purpose of this invention is to provide how to paste together to the adhesives on a bottom disk the optical lamination disk which can be contacted uniformly for an upper part disk, and a laminating apparatus, without damaging the record section of an optical lamination disk.

[0011]Other purposes of this invention are to provide how to paste together the optical lamination disk which can be opened to homogeneity to the necessary range for adhesives,

and a laminating apparatus, without damaging the record section of an optical lamination disk.
[0012]Other purposes of this invention are to provide how to paste an optical lamination disk together and the laminating apparatus which can curve, can maintain an optical lamination disk at an even state [be / nothing], and can harden adhesives.

[0013]

[Means for Solving the Problem]As for this invention, a laminating apparatus of an optical lamination disk of Claim 1 is characterized by that a laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk comprises the following to achieve the above objects.

A means which carries out adsorption maintenance of the disk attaching part inside ring shape heights for accumulation currently formed in the surface of said disk of two sheets at a planate member, respectively.

A means which carries out adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] at a planate member, respectively.

A means to contact an upper disk in adhesives breathed out on a lower disk among said disks of two sheets.

[0014]As for this invention, a laminating apparatus of an optical lamination disk of Claim 2 is characterized by that a laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk comprises the following again.

A means which carries out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets at a planate member.

A means which carries out adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] at a planate member.

A means which opens adhesives supplied between said disks of two sheets to a necessary range in a high velocity revolution.

[0015]As for this invention, an optical lamination disk laminating apparatus of Claim 3 is characterized by that a laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk comprises the following again.

A means which carries out adsorption maintenance of the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets, and said ring shape heights at a planate member.

A means to perform curing treatment of adhesives which were able to be opened in a necessary range between said disks of two sheets.

[0016]A laminating apparatus of an optical lamination disk of Claim 4, In a laminating apparatus of the optical lamination disk according to claim 1 to 3, it is characterized by a flat-surface part of both sides of a planate member which carries out adsorption maintenance of the inside of ring shape heights for accumulation of the above-mentioned disk surface, and a planate member which carries out adsorption maintenance of the outside of said ring shape heights being the same flat surface.

[0017]How to paste an optical lamination disk of Claim 5 together, In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, While carrying out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation which breathes out adhesives on a lower disk among said disks of two sheets, and is formed in the surface of a disk of said upper and lower sides, respectively at a planate member, Where adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] is carried out at a planate member, said up-and-down disk is made to approach, and an upper part disk is contacted in said adhesives.

[0018]How to paste an optical lamination disk of Claim 6 together, In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, While carrying out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation currently formed in the surface of a bottom disk among said disks of two sheets at a planate member, Where adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] is carried out at a planate member, adhesives supplied between up-and-down disks are opened to a necessary range by a high velocity revolution.

[0019]How to paste an optical lamination disk of Claim 7 together, In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, Where adsorption maintenance of the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets and said ring shape heights is carried out at a planate member, curing treatment of adhesives which were able to be opened in a necessary range between up-and-down disks is performed.

[0020]How to paste an optical lamination disk of Claim 8 together, In how to paste together the optical lamination disk according to claim 5 to 7, while carrying out adsorption maintenance of the inside of ring shape heights for accumulation of the above-mentioned disk surface, adsorption maintenance of the outside of said ring shape heights is carried out into the same flat surface as said inside.

[0021]When contacting an upper part disk in adhesives breathed out on a bottom disk in an

invention of Claim 1 or Claim 5, To a planate member, while carrying out adhesion maintenance, a disk attaching part of the ring shape heights inside for accumulation currently formed in the surface of an up-and-down disk, To a planate member, where adsorption maintenance is carried out, at least a part of a before [from the outside of said ring shape heights / the inside of a record section], By making said up-and-down disk approach, an upper part disk can be uniformly contacted in adhesives on a bottom disk, without damaging a record section of an optical lamination disk.

[0022]When opening adhesives supplied between up-and-down disks to a necessary range by a high velocity revolution in Claim 2 or an invention of 6, To a planate member, while carrying out adsorption maintenance, a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface, By contacting uniformly at least a part of a before [from the outside of said ring shape heights / the inside of a record section] to a planate member at adhesives, where adsorption maintenance is carried out, adhesives can be opened to homogeneity to a necessary range, without damaging a record section of an optical lamination disk.

[0023]When performing curing treatment of adhesives which were able to be opened in a necessary range between up-and-down disks in Claim 3 or an invention of 7, By carrying out carrying out adsorption maintenance of the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface, and said ring shape heights at a planate member, it can curve, an optical lamination disk can be maintained at an even state [be / nothing], and adhesives can be hardened.

[0024]In Claim 4 or an invention of 8, since a planate member which carries out adsorption maintenance of the inside of ring shape heights for accumulation, and a planate member which carries out adsorption maintenance of the outside were made into the same flat surface, the inside and the outside of ring shape heights for accumulation can be made into the same flat surface.

[0025]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to Drawings. Common numerals are given to the portion which is common in below, and the explanation is omitted. Drawing 1 is an example of the optical disk laminating apparatus which uses this invention.

[0026]This optical disk laminating apparatus is provided with the following.

The supply stage 1 to which the upper part disk 3 and the bottom disk 2 are supplied by the disk feed unit which is not illustrated.

The spinner 5 in which a high velocity revolution is possible to the circumference of the axis of rotation.

The carrier robot 4 which conveys a disk from the supply stage 1 to the spinner 5 and which is

a horizontal and perpendicularly movable intersected [perpendicularly] type biaxial robot. The regurgitation nozzle 6 of the revolution type which carries out the regurgitation of the adhesives to the disk on the spinner 5, The UV irradiation tray 8 in which the disk with which adhesives were breathed out is conveyed by the carrier robot 4 from the spinner 5, Ultraviolet curing unit 9 which forms the field by which UV irradiation is carried out, and the moving mechanism 10 which passes the field by which UV irradiation is carried out with the UV irradiation tray 8 in the disk on the UV irradiation tray 8, The extraction arm 11 which removes the disk by which UV irradiation was carried out from the UV irradiation tray 8 to the discharge stage 12.

[0027]Next, operation of this optical disk laminating apparatus is explained. First, by the disk feed unit which is not illustrated, on the supply stage 1, the bottom disk 2 turns an adhesion side upwards, and is supplied. Next, on the supply stage 1, the upper part disk 3 turns an adhesion side downward, and is supplied. Hereafter, it is repeated.

[0028]The bottom disk 2 first carried on the supply stage 1 is sent by the carrier robot 4 on the spinner 5, it ranks second and the upper part disk 3 carried on the supply stage 1 is also sent by the carrier robot 4 on the spinner 5. Thus, the bottom disk 2 and the upper part disk 3 are sent on the spinner 5 by turns.

[0029]After the first bottom disk 2 is carried on the supply stage 1, the regurgitation nozzle 6 of a revolution type starts, the adhesives 7 are breathed out with the low speed rotary of the spinner 5, and it is made the form of doughnut form on the bottom disk 2 surface.

[0030]Next, after the regurgitation nozzle 6 shunts and the low speed rotary of the spinner 5 stops, the carrier robot 4 piles up the upper part disk 3 on the bottom disk 2 on the spinner 5. Then, the spinner 5 carries out a high velocity revolution, and opens adhesives to the necessary range.

[0031]High velocity revolution processing of the spinner 5 is completed, and the upper part disk 3 and the bottom disk 2 which were stuck via unhardened adhesives are moved by the carrier robot 4 on the UV irradiation tray 8.

[0032]Next, the UV irradiation tray 8 carries and carries the upper part disk 3 and the bottom disk 2 which stuck [above-mentioned] through the field by which UV irradiation is carried out with Ultraviolet curing unit 9 via the moving mechanism 10, and stiffens the adhesives 7.

[0033]The disk which the adhesives 7 hardened, pasted together and completed is moved from on the UV irradiation tray 8 on the discharge stage 12 by the extraction arm 11. The disk on the discharge stage 12 is removed with the disk exhaust which is not illustrated.

[0034]Drawing 2 is the 1st working example of this invention, and shows the state of contacting the upper part disk 3 to the adhesives 7 breathed out on the spinner 5 of drawing 1 at the bottom disk 2 top.

[0035]In drawing 2, the rotary head 13 of the spinner 5 is laying the bottom disk 2, and the carrier robot's 4 carrying head 14 holds the upper part disk 3.

[0036]Both the rotary head 13 and the carrying head 14 are carrying out the cylindrical shape. The outer diameter of the rotary head 13 and the carrying head 14 is smaller than the inside diameter of the record section R of a disk, and larger than the outer diameter of the ring shape heights 15 for accumulation of a disk. In order to avoid interference with the ring shape heights 15 for accumulation, the relief groove 16 is formed. The adsorption holes 17 are arranged at the flat surface (the inside adsorption attaching parts 13a and 14a, ring shape adsorption attaching parts 13b and 14b) in contact with a disk, and these adsorption holes 17 are arranged at both the inside of the ring shape heights 15 for accumulation, and the outside.

[0037]Since what makes a folding point the ring shape heights 15 for accumulation is main in practice as for the curvature produced on a disk, if adsorption maintenance of the inside and the outside of the ring shape heights 15 for accumulation is carried out simultaneously as mentioned above, The great portion of curvature of a disk can be corrected, and the upper part disk 3 and the bottom disk 2 can be held almost in parallel. A crack is not attached to the record section R of a disk.

[0038]Thus, if the upper part disk 3 is contacted in the adhesives 7 on the bottom disk 2, it can be made to be able to contact uniformly and the contamination of air bubbles can be controlled. The upper part disk 3 is carried on the bottom disk 2 on both sides of the adhesives 7, Since a high velocity revolution can be carried out, turning at the bottom disk 2 and carrying out adsorption maintenance horizontally [there is nothing and] by the rotary head 13 when carrying out a high velocity revolution by the rotary head 13, The upper part disk 3 is also level corrected by operation of the surface tension of the adhesives 7, and the adhesives 7 can be uniformly opened over the necessary range. At this time, a crack is not attached to the record section R of a disk.

[0039]The figure and drawing 4 which drawing 3 shows the 2nd working example of this invention are a figure for explaining operation of the 2nd working example of this invention. In this 2nd working example, by performing the process of piling up the upper part disk 3 and the bottom disk 2 via the adhesives 7, in a former stage from the spinner 5, and performing disk pile operation to a high velocity revolution and a concurrency, when raising the throughput of a device, it is used.

[0040]Drawing 3 expresses with the carrying head 18 the scene where the 2nd ascending and descending stage 20 passes the bottom disk 2, in drawing 4. The carrying head 18 is provided with both the adsorbing function on the upper surface of a disk, and the mechanical retaining function of the vertical end face of bottom disk 2 center hole by the pawl 21.

[0041]The carrying head 18 is provided with the air cylinder 22 which drives the pawl 21 and the pawl 21 with the adsorption holes 17. The 2nd ascending and descending stage 20 is also

equipped with the adsorption holes 17.

[0042]Here the carrying head 18 and the 2nd ascending and descending stage 20, The flat surface (the inside adsorption attaching parts 18a and 20a, ring shape adsorption attaching parts 18b and 20b) which equips both the inside of the ring shape heights 15 for accumulation of a disk surface and the outside with the adsorption holes 17, and contacts a disk is restricted inside the record section R of a disk.

[0043]Next, drawing 4 explains operation of this 2nd working example. First, the carrying head 18 reaches above the 1st ascending and descending stage 19 in which the upper part disk 3 is laid in the state where the adhesion side was placed upside down. Then, the 1st ascending and descending stage 19 goes up, the carrying head 18 is made to carry out adsorption maintenance of the upper part disk 3, and downward evacuation is carried out.

[0044]Next, the bottom disk 2 turns an adhesion side upward, and the carrying head 18 moves the adhesives 7 above the 2nd ascending and descending stage 20 currently laid in the state where it was breathed out on it, Then, the 2nd ascending and descending stage 20 goes up, the vertical end face of the center hole of the bottom disk 2 is made to hold by the pawl 21 of the carrying head 18, and downward evacuation is carried out.

[0045]The carrying head 18 which held the upper part disk 3 and the bottom disk 2 on both sides of the adhesives 7 as mentioned above transfers these on the rotary head 13 of the spinner 5. Since according to this 2nd working example the upper part disk 3 is kept parallel to the bottom disk 2 and it is contacted in the adhesives 7 on the bottom disk 2, the contamination of air bubbles can be controlled.

[0046]Drawing 5 is a figure showing the 3rd working example of this invention, and shows the UV irradiation tray 8 and the moving mechanism 10 in drawing 1. Here, the UV irradiation tray which lays a disk is sent to a rectilinear direction by the ball screw 23 and the guide shaft 24. Thereby, adhesives are made to expose to them and harden ultraviolet rays by moving a disk through a UV irradiation field.

[0047]The structure of the UV irradiation tray 8 is shown in drawing 6. The UV irradiation tray 8 is embedded at the support 25, and although not illustrated, it is supported by the moving mechanism 10. The light reflector 26 for helping hardening of the adhesives 7 of a disk end is installed in the circumference.

[0048]The adsorption holes 17 are formed in the inside adsorption attaching part 8a and the outside adsorption attaching part 8b of a UV irradiation tray 8 table flat surface. These adsorption holes 17 are allotted to the inside and the outside of the ring shape heights 15 for accumulation of a disk. This is connected to the vacuum passage 27 given in drawing 5.

[0049]Since it pastes together in an adhesive setting part and the state of the final curvature of a disk is decided, it is preferred unlike other treating parts, to stick the whole disk surface at a flat surface, and to stiffen it. Since this portion is not accompanied by rapid movement, danger

with a disk flaw is low, and since it is finished very smoothly, even if it contacts the flat surface which contacts a disk considering the purpose of curving and pasting a disk together there being nothing and also to the record section R of a disk, it is not damaged.

[0050]Although arranged in drawing 6 only at the position to which the adsorption holes 17 contact the central part of a disk, it may arrange in the position which crosses all over a disk and contacts. The arrangement and the number of these adsorption holes 17 are suitably decided according to the state of the curvature of the single plate disk in front of lamination.

[0051]Since the upper part disk 3 is also corrected by the surface tension of the adhesives 7 by the above mechanisms in order to make a smooth flat surface carry out adsorption maintenance of the bottom disk 2, adhesive setting is made in the state with an up-and-down even disk, and a lamination disk without curvature can be made.

[0052]Drawing 7 is a figure showing the 4th working example of this invention, the turntable 28 is used instead of the moving mechanism 10 in drawing 5, and the six UV irradiation trays 8 are equipped.

[0053]Let the position of the UV irradiation tray 8 of a graphic display be a tray stop position in this working example. That is, it has a tray stop position of six places. And after making direction of an arrow rotate the UV irradiation tray 8 to the next stop position with a definite angle, operation of making it stop is repeated. As this driving source, the cam type indexing unit 29 is used in many cases. The UV irradiation field is provided between the above-mentioned tray stop positions. If a disk is thrown into the position of a graphic display with such a device, after being sent in intermittent rotational movement and receiving UV irradiation, it is taken out from the position of a graphic display.

[0054]Since according to this curing treatment is performed while two or more UV irradiation trays 8 circulate, there is no necessity that a moving mechanism returns one by one, and the motion cycle time of a device can be shortened. However, there are the following problems in such a mechanism. That is, a disk is adsorbed [1st] only at the time of UV irradiation, and the rest is that delivery of a disk does not work unless it controls not to adsorb. Since movement of a disk turns into circle movement the 2nd, movement speed has a difference in a portion far from the portion near the center of rotation of the turntable 28, and the ultraviolet energy to receive is not becoming uniform in a disc face.

[0055]In working example shown in drawing 7, the measures for canceling the above-mentioned problem are taken. Drawing 8 which is a sectional view of working example of drawing 7 explains it.

[0056]In drawing 8, the structure of the UV irradiation tray 8 and its neighborhood is the same as that of what is shown in drawing 6. However, the axis of rotation 30 is combined with the UV irradiation tray 8 in one, and the bearing case 32 is equipped with the axis of rotation 30 via the bearing 31 with a seal. The bearing case 32 is installed in the turntable 28.

[0057]The vacuum passage 27 connected with the adsorption holes 17 is formed in said axis of rotation 30, and it is connected to a vacuum source from the building envelope of the bearing case 32 via the mechanical operated valve 33, the vacuum piping 34, and the revolving piping joint 34a.

[0058]The axis of rotation 30 is combined with the 1st epicyclic gear 35. This 1st epicyclic gear 35 meshes with the 2nd epicyclic gear 36, and the 2nd epicyclic gear 36 meshes with the fixed gear 37.

[0059]The 2nd epicyclic gear 36 is installed in the turntable 28 via the bearing 38 and the support 39, enabling free rotation. The fixed gear 37 is installed in the turntable 28 and a concentric position. For this reason, it is installed via the bearing 43 by the rotating bosses 41 and 42 who combine the output shaft 40 of the turntable 28 and the cam type indexing unit 29, and is combined with the standing ways 45 by the baffle pin 44. The 1st epicyclic gear 35 and 2nd epicyclic gear are six pieces each, and, as for the number of fixed gears, the number of each above gear is one.

[0060]The measure against the above-mentioned problem in the above devices is explained. Sticking to the 1st problem, i.e., a disk, first only at the time of UV irradiation, the rest explains controlling not to adsorb.

[0061]This copes with it by controlling by the mechanical operated valve 33 equipped one piece at a time to one of the UV irradiation tray 8. Drawing 9 explains this. The mechanical operated valves 33 are three directional valves, and in the natural state, it is connected so that the adsorption holes 17 may become atmospheric pressure like drawing 9 (a). Here, if the energizing force of the spring 33b is resisted and the roller 46 and the plunger 33a are pushed in, it will change so that the adsorption holes 17 may be connected with a vacuum source like drawing 9 (b).

[0062]Such a mechanical operated valve 33 is rotated with the turntable 28, and the fixed dog 47 as shown in drawing 9 (b) is arranged in the position in which the UV irradiation tray 8 passes through a UV irradiation field, and it is made to make the roller 46 stuff into it on the other hand. In the above measures, it becomes possible to make it adsorb only at the time of UV irradiation.

[0063]Next, since movement of the 2nd problem, i.e., a disk, turns into circle movement, the measure against movement speed having a difference in a portion far from the portion near the center of rotation of the turntable 28, and the ultraviolet energy to receive not becoming uniform in a disc face is explained.

[0064]It is coped with by this using an epicyclic gear and making the UV irradiation tray 8 rotate to an opposite direction during rotation of the turntable 28. Drawing 10 explains this. Drawing 10 is the figure which pictured only each epicyclic gear and a fixed gear. In drawing 10, a dashed dotted line shows the pitch circle of the gear.

[0065]As shown in drawing 10, the turntable 28 (refer to drawing 8) shall rotate like a clockwise rotation, i.e., position A->B->C->D, the position A shall have a UV irradiation field in a disk feeding position, and there shall be the position D between a disk extraction position and position BC.

[0066]Here, the number of teeth of the fixed gear 37 and the 1st epicyclic gear 35 shall presuppose that it is the same, and the number of teeth of the 2nd epicyclic gear 36 shall be selected to a value suitable for engagement. When the turntable 28 rotates and the UV irradiation tray 8 moves to the position B from the position A, the 2nd epicyclic gear 36 meshes with the fixed gear 37, and rotates clockwise, and simultaneously, the 1st epicyclic gear 35 meshes with the 2nd epicyclic gear 36, and rotates counter clockwise. Since the moderating ratio of these three trains of gears is 1, the UV irradiation tray 8 combined with the 1st epicyclic gear 35 will rotate only the part of angle of rotation of the turntable 28 to an opposite direction.

[0067]Here, if the arrow 8 for a mark was put on the UV irradiation tray 8 in the position A, also when it comes to the position B, the direction which the arrow 8 shows does not change. This is the same in any positions of the turntable 28. This shows that all the points on the UV irradiation tray 8 are exercising at the same direction and speed, if the arbitrary times of a before [from the rotation start of the turntable 28 / a stop] are taken. That is, all the points on the UV irradiation tray 8 mean having passed through the UV irradiation field for the same speed history. Therefore, in all the positions on a disc face, it turns out that the quantity of the ultraviolet energy to receive becomes fixed. The movement speed difference of a disk is cancelable in the above measures.

[0068]

[Effect of the Invention]According to Claim 1 or the invention of 5, both the disks by the side of the upper and lower sides by which adsorption maintenance is carried out have small curvature so that clearly from the above explanation. Curvature which generates the ring shape heights for accumulation as a folding point especially can be made small. Therefore, an upper part disk and a bottom disk can be kept parallel. Thus, it can be prevented from the method of contact becoming uniform and involving in air bubbles in the state with parallel upper part disk and bottom disk, if an upper part disk is contacted in the adhesives on a bottom disk. Since an adsorbing member does not contact the record section of a disk, there is no danger of damaging the record section of a disk.

[0069]According to Claim 2 or the invention of 6, since it can turn at a bottom disk and a high velocity revolution can be carried out in the level state [be / nothing] even when carrying an upper part disk on a bottom disk and carrying out a high velocity revolution on both sides of adhesives, it is easy to open adhesives uniformly. Since an adsorbing member does not contact the record section of a disk, there is no danger of damaging the record section of a disk.

[0070]According to Claim 3 or the invention of 7, in an adhesive setting part, since curvature of each single plate disk can be made small even if it is in the state which the upper part disk and the bottom disk stuck on both sides of adhesives, the compound curvature is small. Therefore, the thickness distribution of adhesives is not made to produce disorder.

[0071]According to Claim 4 or the invention of 8, since the planate member which carries out adsorption maintenance of the inside of the ring shape heights for accumulation, and the planate member which carries out adsorption maintenance of the outside were made into the same flat surface, the inside and the outside of the ring shape heights for accumulation can be made into the same flat surface, and the curvature of a disk can be prevented easily.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention]This invention relates to how to paste together the optical lamination disk which uses liquid adhesives especially about audio information, video information or the manufacturing method of the lamination disk which usually performs record or playback of data to a optical type, and a manufacturing installation, and its device.

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PRIOR ART

[Description of the Prior Art]As a laminating apparatus of the conventional optical disk, there was a thing as shown, for example in drawing 11. Drawing 11 shows the portion which piles up a disk among the laminating apparatus which stick a disk using liquid adhesives.

[0003]In drawing 11, the adhesives 7 are breathed out by doughnut form with the adhesive discharging apparatus which is not illustrated on the bottom disk 2.

Adsorption maintenance is carried out on the rotary head 113.

On this bottom disk 2, after the carrying head 114 which carried out adsorption maintenance of the upper part disk 3 descending and contacting the upper part disk 3 surface in the adhesives 7, adsorption of the upper part disk 3 is released, and it goes up and shunts again. Then, the rotary head 113 starts a high velocity revolution, where the adhesives 7 are inserted between them, it carries out the high velocity revolution of the upper part and the bottom disks 3 and 2, and it opens the adhesives 7 in the necessary range.

[0004]In order to avoid giving a crack to a record section by contacting the record section of a disk, said rotary head 113 and the carrying head 114 are constituted so that it may adsorb, the inside, i.e., the disk attaching part, of the ring shape heights for accumulation. In drawing 12, the upper part disk 3 and the bottom disk 2 are carried on the tray 50 in the state where it stuck with the adhesives 7 which are not hardened [which was able to be extended in the necessary range]. In this state, the upper part disk 3 and the bottom disk 2 are passing through the field where ultraviolet rays are irradiated, and moving with Ultraviolet curing unit 9 which is a curing means, and adhesives are hardened. On the upper part disk 3, the weight 51 made from transparent construction material like glass for reform of the curvature of a disk may be carried.

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EFFECT OF THE INVENTION

[Effect of the Invention]According to Claim 1 or the invention of 5, both the disks by the side of the upper and lower sides by which adsorption maintenance is carried out have small curvature so that clearly from the above explanation. Curvature which generates the ring shape heights for accumulation as a folding point especially can be made small. Therefore, an upper part disk and a bottom disk can be kept parallel. Thus, it can be prevented from the method of contact becoming uniform and involving in air bubbles in the state with parallel upper part disk and bottom disk, if an upper part disk is contacted in the adhesives on a bottom disk. Since an adsorbing member does not contact the record section of a disk, there is no danger of damaging the record section of a disk.

[0069]In Claim 2 or the invention of 6, even when carrying an upper part disk on a bottom disk and carrying out a high velocity revolution on both sides of adhesives, it can turn at a bottom disk and a high velocity revolution can be carried out in the level state [be / nothing]. Therefore, it is easy to open adhesives uniformly.

Since an adsorbing member does not contact the record section of a disk, there is no danger of damaging the record section of a disk.

[0070]In Claim 3 or the invention of 7, in an adhesive setting part, even if it is in the state which the upper part disk and the bottom disk stuck on both sides of adhesives, curvature of each single plate disk can be made small.

Therefore, the compound curvature is small.

Therefore, the thickness distribution of adhesives is not made to produce disorder.

[0071]In Claim 4 or the invention of 8, the planate member which carries out adsorption maintenance of the inside of the ring shape heights for accumulation, and the planate member which carries out adsorption maintenance of the outside were made into the same flat surface. Therefore, the inside and the outside of the ring shape heights for accumulation can be made into the same flat surface, and the curvature of a disk can be prevented easily.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, when adsorption maintenance of the inside of the ring shape heights for accumulation is carried out, curvature of the disk by internal distortion, prudence, etc. of a disk cannot be corrected. Drawing 13 showed this state.

[0006]Drawing 13 is a sectional view of drawing 11. The disk by which adsorption maintenance is carried out here has [the upper part and the bottom] large curvature. Although this curvature is generated for the above-mentioned Reason, what generates the ring shape heights 15 for accumulation as a folding point especially is large. The size of this curvature is uneven in many cases, and it is difficult to keep parallel the upper part disk 3 and the bottom disk 2 here. Thus, in the state which is not parallel, if the upper part disk 3 is contacted in the adhesives 7 on the bottom disk 2, the method of contact will become uneven and will tend to involve in air bubbles.

[0007]Since it can turn at the bottom disk 2 and a high velocity revolution cannot be carried out in the level state [be / nothing] even when carrying the upper part disk 3 on the bottom disk 2 and carrying out a high velocity revolution on both sides of the adhesives 7, it is difficult to open the adhesives 7 uniformly.

[0008]In order to cancel the above problems, also making a planate member carry out adsorption maintenance of the whole disk surface is considered, but now, said adsorbing member will contact the record section of a disk, and there is a danger of damaging the record section of a disk.

[0009]If it is in the adhesive setting part shown in drawing 12, even if it is in the state which the upper part disk 3 and the bottom disk 2 stuck on both sides of the adhesives 7, curvature which compounded the curvature of each single plate disk occurs. If the weight 51 is carried in order to correct this, the contact condition of the weight 51 and a disk surface with curvature will not become uniform, but will become the cause of making the thickness distribution of the adhesives 7 producing disorder. The adverse effect of soiling the member of the neighborhood

also has the adhesives 7 extruded with weight.

[0010]Then, the purpose of this invention is to provide how to paste together to the adhesives on a bottom disk the optical lamination disk which can be contacted uniformly for an upper part disk, and a laminating apparatus, without damaging the record section of an optical lamination disk.

[0011]Other purposes of this invention are to provide how to paste together the optical lamination disk which can be opened to homogeneity to the necessary range for adhesives, and a laminating apparatus, without damaging the record section of an optical lamination disk.

[0012]Other purposes of this invention are to provide how to paste an optical lamination disk together and the laminating apparatus which can curve, can maintain an optical lamination disk at an even state [be / nothing], and can harden adhesives.

[Translation done.]

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MEANS

[Means for Solving the Problem]As for this invention, a laminating apparatus of an optical lamination disk of Claim 1 is characterized by that a laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk comprises the following to achieve the above objects.

A means which carries out adsorption maintenance of the disk attaching part inside ring shape heights for accumulation currently formed in the surface of said disk of two sheets at a planate member, respectively.

A means which carries out adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] at a planate member, respectively.

A means to contact an upper disk in adhesives breathed out on a lower disk among said disks of two sheets.

[0014]As for this invention, a laminating apparatus of an optical lamination disk of Claim 2 is characterized by that a laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk comprises the following again.

A means which carries out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets at a planate member.

A means which carries out adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] at a planate member.

A means which opens adhesives supplied between said disks of two sheets to a necessary range in a high velocity revolution.

[0015]As for this invention, an optical lamination disk laminating apparatus of Claim 3 is

characterized by that a laminating apparatus which pastes a disk of two sheets together up and down, and makes an optical lamination disk comprises the following again.

A means which carries out adsorption maintenance of the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets, and said ring shape heights at a planate member.

A means to perform curing treatment of adhesives which were able to be opened in a necessary range between said disks of two sheets.

[0016]A laminating apparatus of an optical lamination disk of Claim 4, In a laminating apparatus of the optical lamination disk according to claim 1 to 3, it is characterized by a flat-surface part of both sides of a planate member which carries out adsorption maintenance of the inside of ring shape heights for accumulation of the above-mentioned disk surface, and a planate member which carries out adsorption maintenance of the outside of said ring shape heights being the same flat surface.

[0017]How to paste an optical lamination disk of Claim 5 together, In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, While carrying out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation which breathes out adhesives on a lower disk among said disks of two sheets, and is formed in the surface of a disk of said upper and lower sides, respectively at a planate member, Where adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] is carried out at a planate member, said up-and-down disk is made to approach, and an upper part disk is contacted in said adhesives.

[0018]How to paste an optical lamination disk of Claim 6 together, In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, While carrying out adsorption maintenance of the disk attaching part of the ring shape heights inside for accumulation currently formed in the surface of a bottom disk among said disks of two sheets at a planate member, Where adsorption maintenance at least of the part of a before [from the outside of said ring shape heights / the inside of a record section] is carried out at a planate member, adhesives supplied between up-and-down disks are opened to a necessary range by a high velocity revolution.

[0019]How to paste an optical lamination disk of Claim 7 together, In a method of pasting a disk of two sheets together up and down, and making an optical lamination disk which pastes together, Where adsorption maintenance of the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface among said disks of two sheets and said ring shape heights is carried out at a planate member, curing treatment of adhesives which were able to be opened in a necessary range between up-and-

down disks is performed.

[0020]How to paste an optical lamination disk of Claim 8 together, In how to paste together the optical lamination disk according to claim 5 to 7, while carrying out adsorption maintenance of the inside of ring shape heights for accumulation of the above-mentioned disk surface, adsorption maintenance of the outside of said ring shape heights is carried out into the same flat surface as said inside.

[0021]When contacting an upper part disk in adhesives breathed out on a bottom disk in an invention of Claim 1 or Claim 5, To a planate member, while carrying out adhesion maintenance, a disk attaching part of the ring shape heights inside for accumulation currently formed in the surface of an up-and-down disk, To a planate member, where adsorption maintenance is carried out, at least a part of a before [from the outside of said ring shape heights / the inside of a record section], By making said up-and-down disk approach, an upper part disk can be uniformly contacted in adhesives on a bottom disk, without damaging a record section of an optical lamination disk.

[0022]When opening adhesives supplied between up-and-down disks to a necessary range by a high velocity revolution in Claim 2 or an invention of 6, To a planate member, while carrying out adsorption maintenance, a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface, By contacting uniformly at least a part of a before [from the outside of said ring shape heights / the inside of a record section] to a planate member at adhesives, where adsorption maintenance is carried out, adhesives can be opened to homogeneity to a necessary range, without damaging a record section of an optical lamination disk.

[0023]When performing curing treatment of adhesives which were able to be opened in a necessary range between up-and-down disks in Claim 3 or an invention of 7, By carrying out carrying out adsorption maintenance of the outside of a disk attaching part of the ring shape heights inside for accumulation currently formed in a bottom disk surface, and said ring shape heights at a planate member, it can curve, an optical lamination disk can be maintained at an even state [be / nothing], and adhesives can be hardened.

[0024]In Claim 4 or an invention of 8, since a planate member which carries out adsorption maintenance of the inside of ring shape heights for accumulation, and a planate member which carries out adsorption maintenance of the outside were made into the same flat surface, the inside and the outside of ring shape heights for accumulation can be made into the same flat surface.

[0025]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to Drawings. Common numerals are given to the portion which is common in below, and the explanation is omitted. Drawing 1 is an example of the optical disk laminating

apparatus which uses this invention.

[0026]This optical disk laminating apparatus is provided with the following.

The supply stage 1 to which the upper part disk 3 and the bottom disk 2 are supplied by the disk feed unit which is not illustrated.

The spinner 5 in which a high velocity revolution is possible to the circumference of the axis of rotation.

The carrier robot 4 which conveys a disk from the supply stage 1 to the spinner 5 and which is a horizontal and perpendicularly movable intersected [perpendicularly] type biaxial robot.

The regurgitation nozzle 6 of the revolution type which carries out the regurgitation of the adhesives to the disk on the spinner 5, The UV irradiation tray 8 in which the disk with which adhesives were breathed out is conveyed by the carrier robot 4 from the spinner 5, Ultraviolet curing unit 9 which forms the field by which UV irradiation is carried out, and the moving mechanism 10 which passes the field by which UV irradiation is carried out with the UV irradiation tray 8 in the disk on the UV irradiation tray 8, The extraction arm 11 which removes the disk by which UV irradiation was carried out from the UV irradiation tray 8 to the discharge stage 12.

[0027]Next, operation of this optical disk laminating apparatus is explained. First, by the disk feed unit which is not illustrated, on the supply stage 1, the bottom disk 2 turns an adhesion side upwards, and is supplied. Next, on the supply stage 1, the upper part disk 3 turns an adhesion side downward, and is supplied. Hereafter, it is repeated.

[0028]The bottom disk 2 first carried on the supply stage 1 is sent by the carrier robot 4 on the spinner 5, it ranks second and the upper part disk 3 carried on the supply stage 1 is also sent by the carrier robot 4 on the spinner 5. Thus, the bottom disk 2 and the upper part disk 3 are sent on the spinner 5 by turns.

[0029]After the first bottom disk 2 is carried on the supply stage 1, the regurgitation nozzle 6 of a revolution type starts, the adhesives 7 are breathed out with the low speed rotary of the spinner 5, and it is made the form of doughnut form on the bottom disk 2 surface.

[0030]Next, after the regurgitation nozzle 6 shuts and the low speed rotary of the spinner 5 stops, the carrier robot 4 piles up the upper part disk 3 on the bottom disk 2 on the spinner 5. Then, the spinner 5 carries out a high velocity revolution, and opens adhesives to the necessary range.

[0031]High velocity revolution processing of the spinner 5 is completed, and the upper part disk 3 and the bottom disk 2 which were stuck via unhardened adhesives are moved by the carrier robot 4 on the UV irradiation tray 8.

[0032]Next, the UV irradiation tray 8 carries and carries the upper part disk 3 and the bottom disk 2 which stuck [above-mentioned] through the field by which UV irradiation is carried out

with Ultraviolet curing unit 9 via the moving mechanism 10, and stiffens the adhesives 7.

[0033]The disk which the adhesives 7 hardened, pasted together and completed is moved from on the UV irradiation tray 8 on the discharge stage 12 by the extraction arm 11. The disk on the discharge stage 12 is removed with the disk exhaust which is not illustrated.

[0034]Drawing 2 is the 1st working example of this invention, and shows the state of contacting the upper part disk 3 to the adhesives 7 breathed out on the spinner 5 of drawing 1 at the bottom disk 2 top.

[0035]In drawing 2, the rotary head 13 of the spinner 5 is laying the bottom disk 2, and the carrier robot's 4 carrying head 14 holds the upper part disk 3.

[0036]Both the rotary head 13 and the carrying head 14 are carrying out the cylindrical shape. The outer diameter of the rotary head 13 and the carrying head 14 is smaller than the inside diameter of the record section R of a disk, and larger than the outer diameter of the ring shape heights 15 for accumulation of a disk. In order to avoid interference with the ring shape heights 15 for accumulation, the relief groove 16 is formed. The adsorption holes 17 are arranged at the flat surface (the inside adsorption attaching parts 13a and 14a, ring shape adsorption attaching parts 13b and 14b) in contact with a disk, and these adsorption holes 17 are arranged at both the inside of the ring shape heights 15 for accumulation, and the outside.

[0037]Since what makes a folding point the ring shape heights 15 for accumulation is main in practice as for the curvature produced on a disk, if adsorption maintenance of the inside and the outside of the ring shape heights 15 for accumulation is carried out simultaneously as mentioned above, The great portion of curvature of a disk can be corrected, and the upper part disk 3 and the bottom disk 2 can be held almost in parallel. A crack is not attached to the record section R of a disk.

[0038]Thus, if the upper part disk 3 is contacted in the adhesives 7 on the bottom disk 2, it can be made to be able to contact uniformly and the contamination of air bubbles can be controlled. The upper part disk 3 is carried on the bottom disk 2 on both sides of the adhesives 7, Since a high velocity revolution can be carried out, turning at the bottom disk 2 and carrying out adsorption maintenance horizontally [there is nothing and] by the rotary head 13 when carrying out a high velocity revolution by the rotary head 13, The upper part disk 3 is also level corrected by operation of the surface tension of the adhesives 7, and the adhesives 7 can be uniformly opened over the necessary range. At this time, a crack is not attached to the record section R of a disk.

[0039]The figure and drawing 4 which drawing 3 shows the 2nd working example of this invention are a figure for explaining operation of the 2nd working example of this invention. In this 2nd working example, by performing the process of piling up the upper part disk 3 and the bottom disk 2 via the adhesives 7, in a former stage from the spinner 5, and performing disk pile operation to a high velocity revolution and a concurrency, when raising the throughput of a

device, it is used.

[0040]Drawing 3 expresses with the carrying head 18 the scene where the 2nd ascending and descending stage 20 passes the bottom disk 2, in drawing 4. The carrying head 18 is provided with both the adsorbing function on the upper surface of a disk, and the mechanical retaining function of the vertical end face of bottom disk 2 center hole by the pawl 21.

[0041]The carrying head 18 is provided with the air cylinder 22 which drives the pawl 21 and the pawl 21 with the adsorption holes 17. The 2nd ascending and descending stage 20 is also equipped with the adsorption holes 17.

[0042]Here the carrying head 18 and the 2nd ascending and descending stage 20, The flat surface (the inside adsorption attaching parts 18a and 20a, ring shape adsorption attaching parts 18b and 20b) which equips both the inside of the ring shape heights 15 for accumulation of a disk surface and the outside with the adsorption holes 17, and contacts a disk is restricted inside the record section R of a disk.

[0043]Next, drawing 4 explains operation of this 2nd working example. First, the carrying head 18 reaches above the 1st ascending and descending stage 19 in which the upper part disk 3 is laid in the state where the adhesion side was placed upside down. Then, the 1st ascending and descending stage 19 goes up, the carrying head 18 is made to carry out adsorption maintenance of the upper part disk 3, and downward evacuation is carried out.

[0044]Next, the bottom disk 2 turns an adhesion side upward, and the carrying head 18 moves the adhesives 7 above the 2nd ascending and descending stage 20 currently laid in the state where it was breathed out on it, Then, the 2nd ascending and descending stage 20 goes up, the vertical end face of the center hole of the bottom disk 2 is made to hold by the pawl 21 of the carrying head 18, and downward evacuation is carried out.

[0045]The carrying head 18 which held the upper part disk 3 and the bottom disk 2 on both sides of the adhesives 7 as mentioned above transfers these on the rotary head 13 of the spinner 5. Since according to this 2nd working example the upper part disk 3 is kept parallel to the bottom disk 2 and it is contacted in the adhesives 7 on the bottom disk 2, the contamination of air bubbles can be controlled.

[0046]Drawing 5 is a figure showing the 3rd working example of this invention, and shows the UV irradiation tray 8 and the moving mechanism 10 in drawing 1. Here, the UV irradiation tray which lays a disk is sent to a rectilinear direction by the ball screw 23 and the guide shaft 24. Thereby, adhesives are made to expose to them and harden ultraviolet rays by moving a disk through a UV irradiation field.

[0047]The structure of the UV irradiation tray 8 is shown in drawing 6. The UV irradiation tray 8 is embedded at the support 25, and although not illustrated, it is supported by the moving mechanism 10. The light reflector 26 for helping hardening of the adhesives 7 of a disk end is installed in the circumference.

[0048]The adsorption holes 17 are formed in the inside adsorption attaching part 8a and the outside adsorption attaching part 8b of a UV irradiation tray 8 table flat surface. These adsorption holes 17 are allotted to the inside and the outside of the ring shape heights 15 for accumulation of a disk. This is connected to the vacuum passage 27 given in drawing 5.

[0049]Since it pastes together in an adhesive setting part and the state of the final curvature of a disk is decided, it is preferred unlike other treating parts, to stick the whole disk surface at a flat surface, and to stiffen it. Since this portion is not accompanied by rapid movement, danger with a disk flaw is low, and since it is finished very smoothly, even if it contacts the flat surface which contacts a disk considering the purpose of curving and pasting a disk together there being nothing and also to the record section R of a disk, it is not damaged.

[0050]Although arranged in drawing 6 only at the position to which the adsorption holes 17 contact the central part of a disk, it may arrange in the position which crosses all over a disk and contacts. The arrangement and the number of these adsorption holes 17 are suitably decided according to the state of the curvature of the single plate disk in front of lamination.

[0051]Since the upper part disk 3 is also corrected by the surface tension of the adhesives 7 by the above mechanisms in order to make a smooth flat surface carry out adsorption maintenance of the bottom disk 2, adhesive setting is made in the state with an up-and-down even disk, and a lamination disk without curvature can be made.

[0052]Drawing 7 is a figure showing the 4th working example of this invention, the turntable 28 is used instead of the moving mechanism 10 in drawing 5, and the six UV irradiation trays 8 are equipped.

[0053]Let the position of the UV irradiation tray 8 of a graphic display be a tray stop position in this working example. That is, it has a tray stop position of six places. And after making direction of an arrow rotate the UV irradiation tray 8 to the next stop position with a definite angle, operation of making it stop is repeated. As this driving source, the cam type indexing unit 29 is used in many cases. The UV irradiation field is provided between the above-mentioned tray stop positions. If a disk is thrown into the position of a graphic display with such a device, after being sent in intermittent rotational movement and receiving UV irradiation, it is taken out from the position of a graphic display.

[0054]Since according to this curing treatment is performed while two or more UV irradiation trays 8 circulate, there is no necessity that a moving mechanism returns one by one, and the motion cycle time of a device can be shortened. However, there are the following problems in such a mechanism. That is, a disk is adsorbed [1st] only at the time of UV irradiation, and the rest is that delivery of a disk does not work unless it controls not to adsorb. Since movement of a disk turns into circle movement the 2nd, movement speed has a difference in a portion far from the portion near the center of rotation of the turntable 28, and the ultraviolet energy to receive is not becoming uniform in a disc face.

[0055]In working example shown in drawing 7, the measures for canceling the above-mentioned problem are taken. Drawing 8 which is a sectional view of working example of drawing 7 explains it.

[0056]In drawing 8, the structure of the UV irradiation tray 8 and its neighborhood is the same as that of what is shown in drawing 6. However, the axis of rotation 30 is combined with the UV irradiation tray 8 in one, and the bearing case 32 is equipped with the axis of rotation 30 via the bearing 31 with a seal. The bearing case 32 is installed in the turntable 28.

[0057]The vacuum passage 27 connected with the adsorption holes 17 is formed in said axis of rotation 30, and it is connected to a vacuum source from the building envelope of the bearing case 32 via the mechanical operated valve 33, the vacuum piping 34, and the revolving piping joint 34a.

[0058]The axis of rotation 30 is combined with the 1st epicyclic gear 35. This 1st epicyclic gear 35 meshes with the 2nd epicyclic gear 36, and the 2nd epicyclic gear 36 meshes with the fixed gear 37.

[0059]The 2nd epicyclic gear 36 is installed in the turntable 28 via the bearing 38 and the support 39, enabling free rotation. The fixed gear 37 is installed in the turntable 28 and a concentric position. For this reason, it is installed via the bearing 43 by the rotating bosses 41 and 42 who combine the output shaft 40 of the turntable 28 and the cam type indexing unit 29, and is combined with the standing ways 45 by the baffle pin 44. The 1st epicyclic gear 35 and 2nd epicyclic gear are six pieces each, and, as for the number of fixed gears, the number of each above gear is one.

[0060]The measure against the above-mentioned problem in the above devices is explained. Sticking to the 1st problem, i.e., a disk, first only at the time of UV irradiation, the rest explains controlling not to adsorb.

[0061]This copes with it by controlling by the mechanical operated valve 33 equipped one piece at a time to one of the UV irradiation tray 8. Drawing 9 explains this. The mechanical operated valves 33 are three directional valves, and in the natural state, it is connected so that the adsorption holes 17 may become atmospheric pressure like drawing 9 (a). Here, if the energizing force of the spring 33b is resisted and the roller 46 and the plunger 33a are pushed in, it will change so that the adsorption holes 17 may be connected with a vacuum source like drawing 9 (b).

[0062]Such a mechanical operated valve 33 is rotated with the turntable 28, and the fixed dog 47 as shown in drawing 9 (b) is arranged in the position in which the UV irradiation tray 8 passes through a UV irradiation field, and it is made to make the roller 46 stuff into it on the other hand. In the above measures, it becomes possible to make it adsorb only at the time of UV irradiation.

[0063]Next, since movement of the 2nd problem, i.e., a disk, turns into circle movement, the

measure against movement speed having a difference in a portion far from the portion near the center of rotation of the turntable 28, and the ultraviolet energy to receive not becoming uniform in a disc face is explained.

[0064]It is coped with by this using an epicyclic gear and making the UV irradiation tray 8 rotate to an opposite direction during rotation of the turntable 28. Drawing 10 explains this. Drawing 10 is the figure which pictured only each epicyclic gear and a fixed gear. In drawing 10, a dashed dotted line shows the pitch circle of the gear.

[0065]As shown in drawing 10, the turntable 28 (refer to drawing 8) shall rotate like a clockwise rotation, i.e., position A->B->C->D, the position A shall have a UV irradiation field in a disk feeding position, and there shall be the position D between a disk extraction position and position BC.

[0066]Here, the number of teeth of the fixed gear 37 and the 1st epicyclic gear 35 shall presuppose that it is the same, and the number of teeth of the 2nd epicyclic gear 36 shall be selected to a value suitable for engagement. When the turntable 28 rotates and the UV irradiation tray 8 moves to the position B from the position A, the 2nd epicyclic gear 36 meshes with the fixed gear 37, and rotates clockwise, and simultaneously, the 1st epicyclic gear 35 meshes with the 2nd epicyclic gear 36, and rotates counter clockwise. Since the moderating ratio of these three trains of gears is 1, the UV irradiation tray 8 combined with the 1st epicyclic gear 35 will rotate only the part of angle of rotation of the turntable 28 to an opposite direction.

[0067]Here, if the arrow 8 for a mark was put on the UV irradiation tray 8 in the position A, also when it comes to the position B, the direction which the arrow 8 shows does not change. This is the same in any positions of the turntable 28. This shows that all the points on the UV irradiation tray 8 are exercising at the same direction and speed, if the arbitrary times of a before [from the rotation start of the turntable 28 / a stop] are taken. That is, all the points on the UV irradiation tray 8 mean having passed through the UV irradiation field for the same speed history. Therefore, in all the positions on a disc face, it turns out that the quantity of the ultraviolet energy to receive becomes fixed. The movement speed difference of a disk is cancelable in the above measures.

[Translation done.]

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
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- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a figure which uses this invention and in which showing the outline of the laminating apparatus of an optical lamination disk.

[Drawing 2]It is a figure in which showing the 1st working example of this invention, and showing the adsorption holding state of an up-and-down disk.

[Drawing 3]It is a figure in which showing the 2nd working example of this invention, and showing the adsorption holding state of an up-and-down disk.

[Drawing 4]It is a figure showing operation of the 2nd working example of this invention.

[Drawing 5]It is a figure showing the 3rd working example of this invention.

[Drawing 6]It is a figure showing the structure of a UV irradiation tray.

[Drawing 7]It is a figure showing the 4th working example of this invention.

[Drawing 8]It is drawing of longitudinal section of working example of drawing 7.

[Drawing 9]It is a figure for explaining control by a mechanical operated valve.

[Drawing 10]It is a figure showing the relation between each epicyclic gear and a fixed gear.

[Drawing 11]It is an explanatory view of the laminating apparatus of the conventional optical disk.

[Drawing 12]It is a figure showing the portion which stiffens adhesives.

[Drawing 13]It is a sectional view of the conventional example of drawing 11.

[Description of Notations]

2 Bottom disk

3 Upper part disk

5 spinner (means which opens adhesives to the necessary range in a high velocity revolution)

8 UV irradiation tray

8a inside adsorption attaching part (means which carries out adsorption maintenance of the disk attaching part inside the ring shape heights for accumulation at a planate member)

8b Outside adsorption attaching part (means which carries out adsorption maintenance of the outside of the ring shape heights for accumulation at a planate member)

10 Ultraviolet curing unit (a means to perform curing treatment of adhesives)

13 Rotary head (a means to contact an upper disk in the adhesives breathed out on the lower disk)

13a inside adsorption attaching part (means which carries out adsorption maintenance of the disk attaching part inside the ring shape heights for accumulation at a planate member)

13b Ring shape adsorption attaching part (means which carries out adsorption maintenance at least of the part of a before [from the outside of the ring shape heights for accumulation / the inside of a record section] at a planate member)

14 Carrying head (a means to contact an upper disk in the adhesives breathed out on the lower disk)

14a Inside adsorption attaching part (means which carries out adsorption maintenance of the disk attaching part inside the ring shape heights for accumulation at a planate member)

14b Ring shape adsorption attaching part (means which carries out adsorption maintenance at least of the part of a before [from the outside of the ring shape heights for accumulation / the inside of a record section] at a planate member)

15 Ring shape heights for accumulation

17 Adsorption holes

18 Carrying head (a means to contact an upper disk in the adhesives breathed out on the lower disk)

18a Inside adsorption attaching part (means which carries out adsorption maintenance of the disk attaching part inside the ring shape heights for accumulation at a planate member)

18b Ring shape adsorption attaching part (means which carries out adsorption maintenance at least of the part of a before [from the outside of the ring shape heights for accumulation / the inside of a record section] at a planate member)

20 The 2nd ascending and descending stage (a means to contact an upper disk in the adhesives breathed out on the lower disk)

20a Inside adsorption attaching part (means which carries out adsorption maintenance of the disk attaching part inside the ring shape heights for accumulation at a planate member)

20b Ring shape adsorption attaching part (means which carries out adsorption maintenance at least of the part of a before [from the outside of the ring shape heights for accumulation / the inside of a record section] at a planate member)

R Record section

[Translation done.]

* NOTICES *

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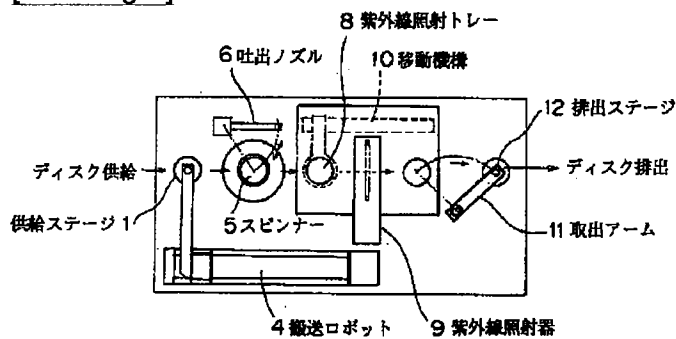
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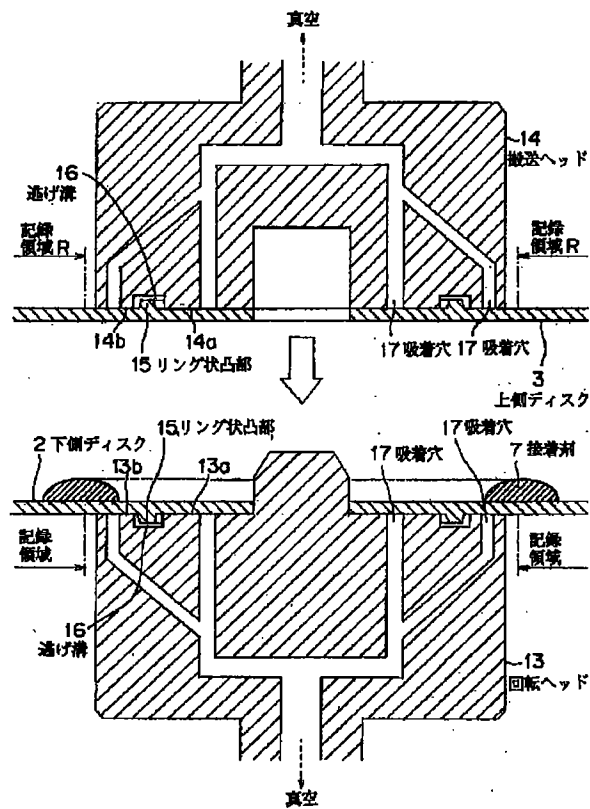
3.In the drawings, any words are not translated.

DRAWINGS

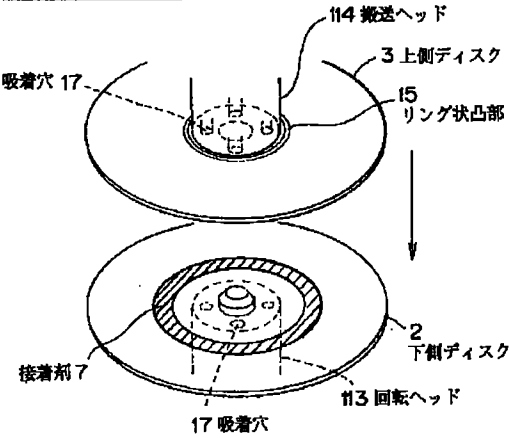
[Drawing 1]



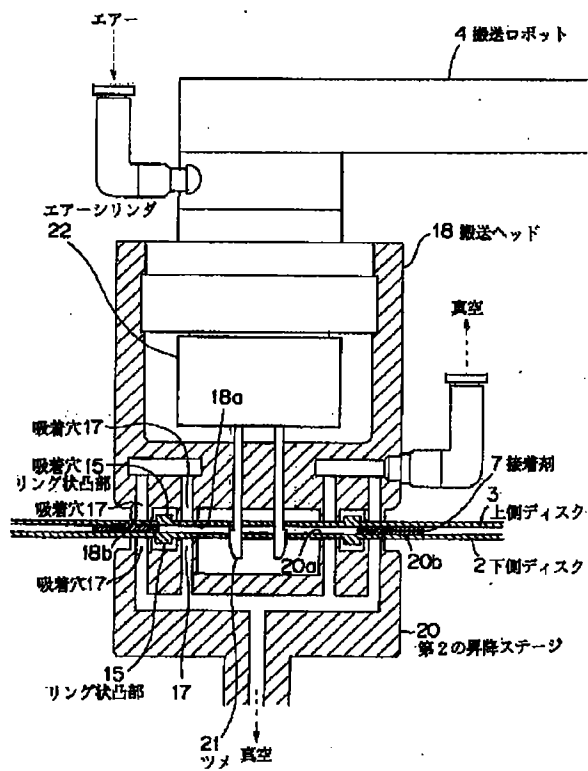
[Drawing 2]



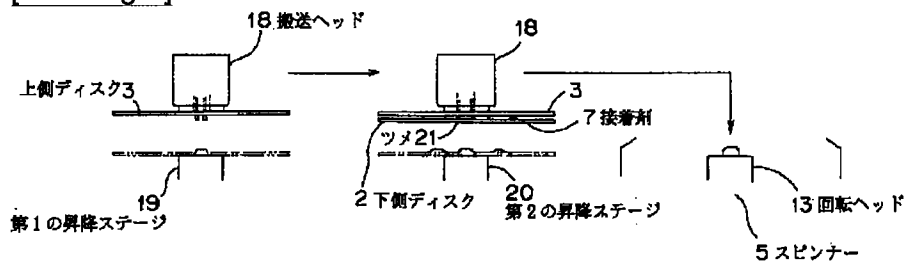
[Drawing 11]



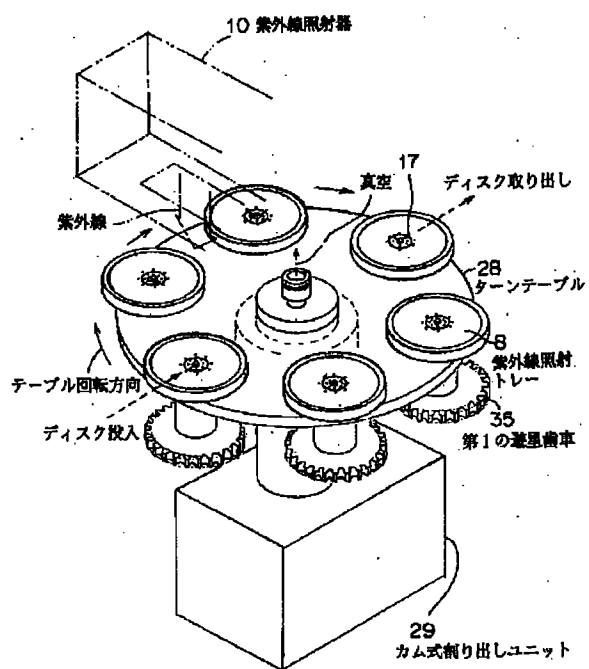
[Drawing 3]



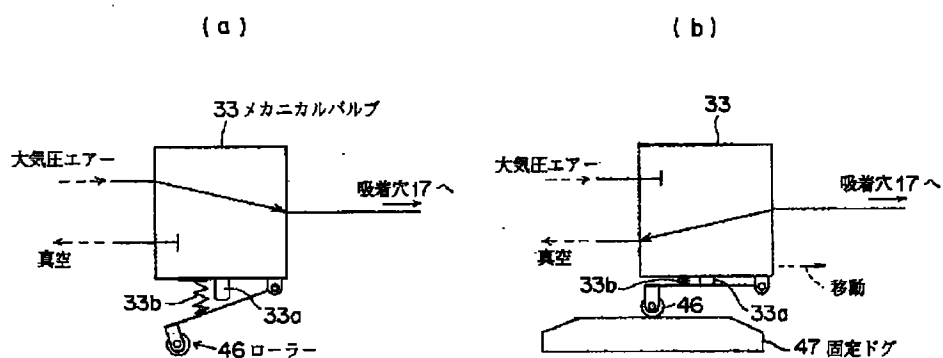
[Drawing 4]



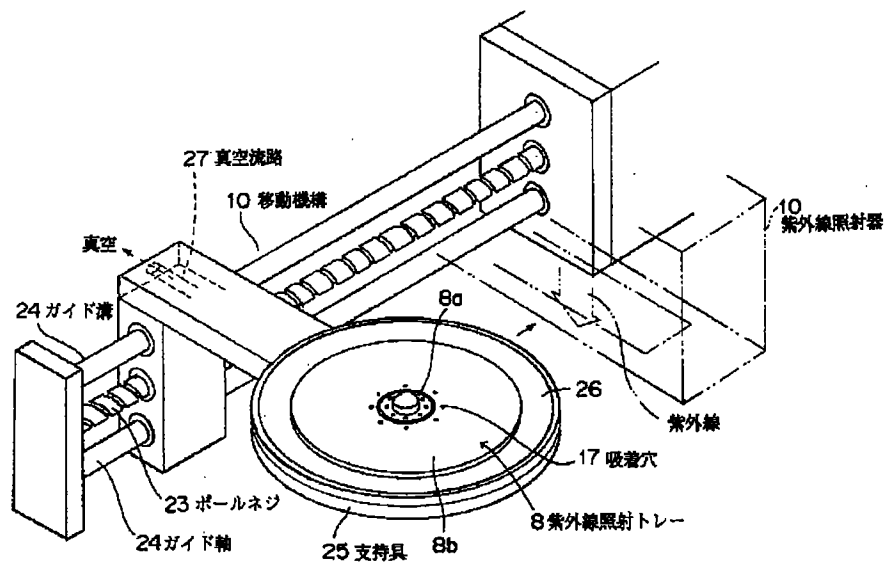
[Drawing 7]



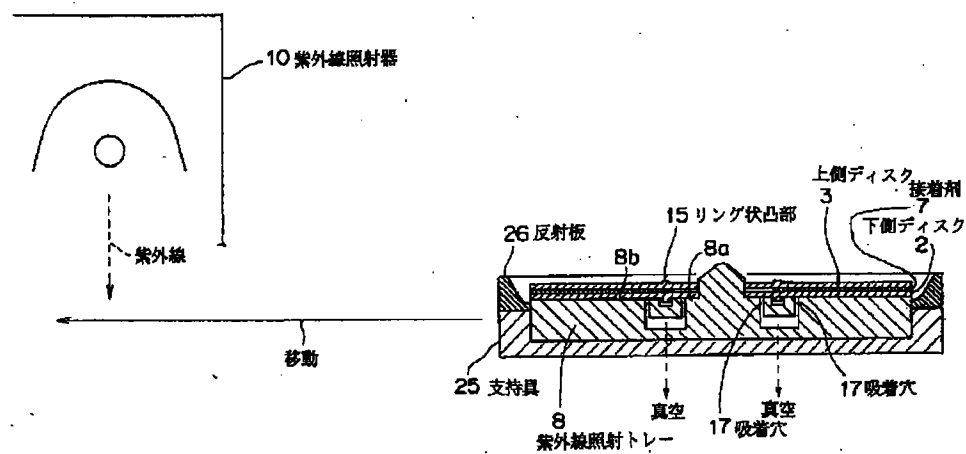
[Drawing 9]



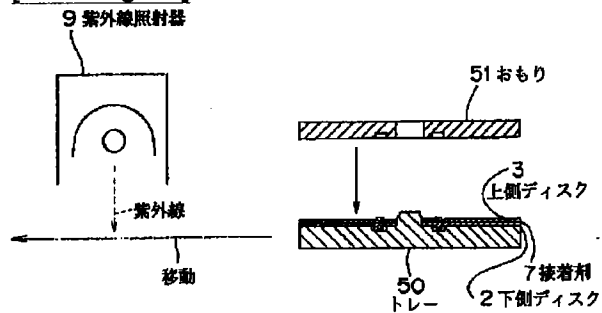
[Drawing 5]



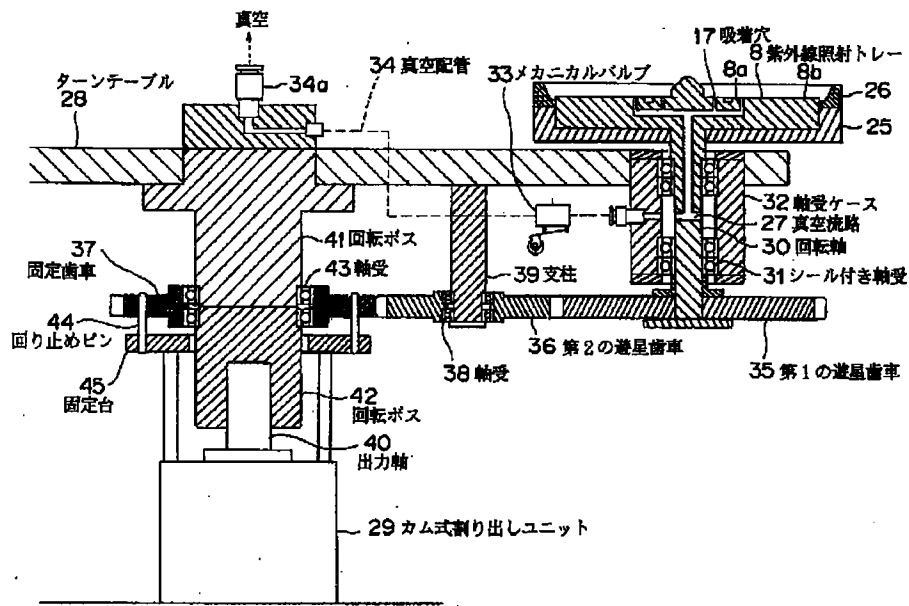
[Drawing 6]



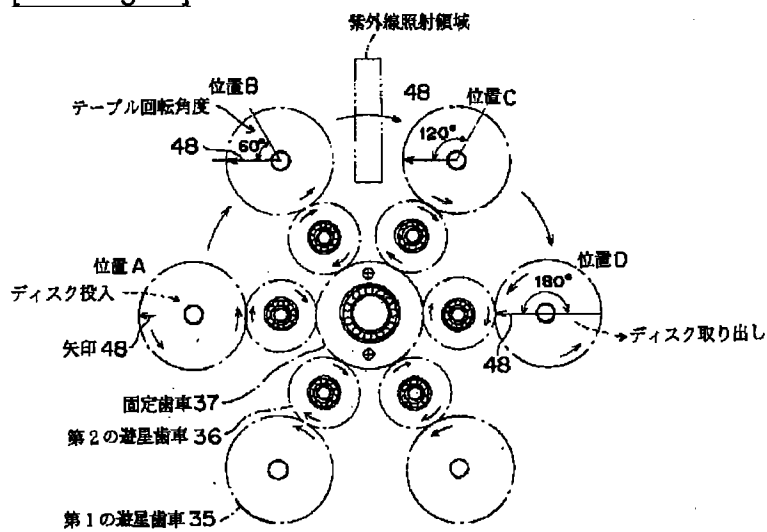
[Drawing 12]



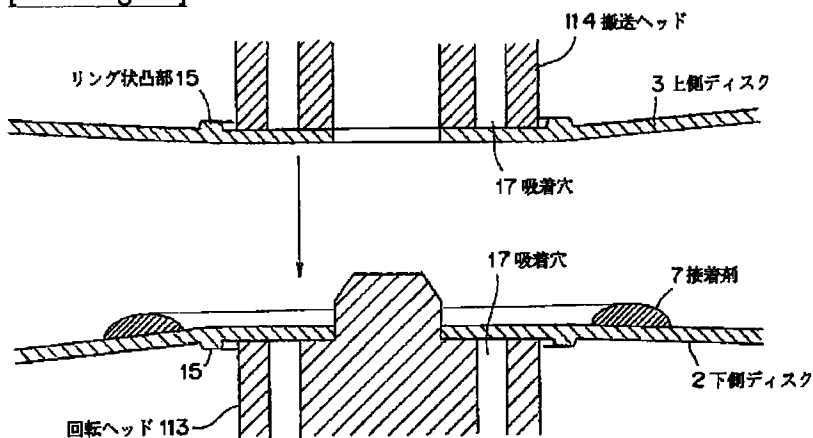
[Drawing 8]



[Drawing 10]



[Drawing 13]



[Translation done.]